



Report of Structural Inspection and Condition Assessment of Trimming Room - Areas 2 & 3 and Press Room - Area 12 at the Former Bossert Manufacturing Facility

EPA Site

Utica, New York

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TABLE OF CONTENTS

I.	INTRODUCTION	Page 1
II.	PURPOSE	1
III.	INSPECTION AREA DESCRIPTION	1-2
IV.	OBSERVATIONS	2-5
V.	CONCLUSION	5-6
VI.	RECOMMENDATIONS	5-6

APPENDICES

SITE KEY PLAN

ROOF PLAN - TRIMMING ROOM - AREA 2

ROOF PLAN - TRIMMING ROOM - AREA 3

ROOF PLAN - PRESS ROOM - AREA 12

SKETCHES - REINFORCEMENT DETAILS 1 THROUGH 7

PHOTOGRAPHS

I. INTRODUCTION

Beginning on November 5, 1997, a structural inspection of three (3) rooms was conducted at the former Bossert Manufacturing site in Utica, New York. The inspection lasted 4 days with the intent of determining the structural integrity of the building area for use in clean-up operations as part of the EPA Superfund project at this site. The plant was used for the manufacture of aircraft parts and has been decommissioned and unoccupied since the early 1980's. Inspection areas have been numbered from 1 through 19.* This report addresses the inspection of **Areas 2, 3 and 12**, since clean-up operations are presently in progress. Some of the buildings are scheduled for demolition after removal of hazardous material is complete.

II. PURPOSE

The primary goal of the inspection is to determine if the designated rooms are safe for workmen to perform clean-up operations which involves remediation of all process equipment and piping and remnant "product" materials. Because the areas within the building need to be "clean" and safe prior to demolition, the purpose of this report is to provide a structural assessment and to recommend repairs.

Since this report covers only three (3) of the approximately sixteen (16) designated rooms of the facility, supplements to this report will be added after future inspections are complete. The intent of any recommended improvements is to allow workmen safety during clean-up operations and is not intended for occupancy and future building use.

III. INSPECTION AREA DESCRIPTION

A. TRIMMING ROOM - AREA 2

Area 2 is constructed of 12" thick brick bearing walls supporting steel trusses spaced approximately 8'-0" on center. The floor plan is approximately 57'x160' and consists of a concrete slab on grade. No basement is present and the footing type and construction cannot be determined. The trusses span 57 feet clear (no columns) and support a wood plank roof. The trusses are irregular in shape and are best described in Detail 1 shown in the APPENDIX. Note that a monitor (raised roof steel frame skylight) is present for the full

* Areas 5, 6, & 17 are undesignated. The "room area designations" were devised by Stetson-Harza, Inc., Utica, NY. See APPENDIX for site plans.

length of the room. A masonry wall is present at the south end separating this room from Area 1.

B. TRIMMING ROOM - AREA 3

North of Area 2 is the Area 3 Trimming Room. There is no separation wall between these areas; however, construction types are quite different. Area 3 consists of 12" brick bearing walls and timber girders which support timber beams. The beams are spaced approximately 5'-4" on center and support plank roofing. The girders are continuous in the north-south direction and form three (3) 19' "aisles" of framing. The column grid spacing is 16'-0" NS x 19'-0" EW and supported by a slab on grade. The columns support the load of the timber girders. The floor plan shows the room as approximately 57'x300' and is found in the APPENDIX. Note that the "outer aisles" have timber beams which support the roof load and the "center aisle" supports only equipment load.

This center aisle also contains a monitor (raised roof skylight) constructed of timbers. An area of roof at the north end has collapsed. A common brick wall is present separating the above mentioned rooms with the Press Room - Area 12.

C. PRESS ROOM - AREA 12

The Press Room is a very large area covering approximately 165'x300'. Multiple roofs, skylights and a courtyard to the east make this room irregular in shape where shown in the plan - APPENDIX. Two (2) roof areas have collapsed where shown on the plan.

Large presses are present in Area 12 which appear to have been placed prior to erection of the structural roof framing. As a result, special roof framing (by design) is present where the upper part of the presses meet the roof steel or timber framing. The special framing around these presses is questionable and must be addressed in future inspections and reports. Repairs may be needed in specified areas.

IV. OBSERVATIONS

Member sizes and spacings were determined from field measurements. Structural steel or timber members were visually inspected for overall condition and estimated degree of deterioration. Connections were checked for missing rivets or bolts for evidence of overloading or excessive deflection. Roof failures which have occurred were studied in order to assess potential failures in the remaining structures.

In general, it is the Earth Tech's opinion that the building structure encompassing **Areas 2,3, and 12** is not safe. The specified minimum requirements to reinforce missing, damaged or otherwise failed members must be made in order to make the building safe prior to continuing clean-up operations. Also, it should be mentioned that a variety of materials were used in the construction of the building(s). Due to the damp environment which the steel and timber has been subjected to, advanced deterioration has occurred primarily in locations of leaky walls and roofing.

A. AREA 2 - TRIMMING ROOM ROOF PLAN

The 12" brick bearing walls are in generally good condition and support the ends of the steel trusses. The ends of the trusses are fully embedded in the brick masonry with no evidence of loose brick surrounding the truss ends. The overall appearance of the trusses show that they are well constructed and have less than 10% material loss at any cross-section. There are exceptions. Two (2) trusses exist with a missing lower chord member, obviously due to intentional cutting and removal likely at a time when the plant was operational. Specifically, the lower chord double angle $2L2\frac{1}{2} \times 2 \times \frac{1}{4}$ was removed and a gusset was severely damaged as shown on sketch Detail 1 of the APPENDIX.

An analysis of the truss indicates that the missing member is needed to transfer the "tension force" to the remaining members between lower chord panel points. A calculated tension load of 36 kips in this member is due to combined dead and snow load. A replacement member is required to be field welded at the two (2) affected trusses.

Another area of concern is that the trusses near the south end of **Area 2** support excessive loads of hanging equipment. In some cases, this equipment is suspended by rods which are located too far (more than the recommended maximum of 6") from the truss panel points. Since deflection of these trusses is noticable, all equipment should be removed from the truss. Note, however, that the structural steel attachments, piping or HVAC ducts may remain.

It is important that all of the above repairs and equipment removal be made prior to the first major snowfall.

B. AREA 3 - TRIMMING ROOM ROOF PLAN

The 12" brick bearing walls are in relatively poor condition especially where excessive moisture is evident. This is due to continued "wash-out" of the cement mortar between the brick. In some instances this has caused bricks to displace inward. At least one (1) timber beam no longer has adequate bearing on the supporting brick. Grout is required to fill the void around the timber beam(s) - See Detail 2 - APPENDIX.

It is Earth Tech's opinion that the cause of roof collapse at the northwest corner is due to failure in a connection of the prefabricated timber beam. A "hinge" developed in at least one timber beam at the "ship-lap" connection located approximately three (3) feet from the west end. The hinge is presumably caused by fatigue and resultant joint separation and failure at this ship-lap connection. Evidence of additional timber beams with the same connection problems has been found. A single bolt vertically placed in the joint further identifies this connection. These beams should be shored near the ship-lap joint as shown in Detail 3 - APPENDIX.

Another problem has been identified as a result of the roof collapse. The wood frame skylight, by design, was supported by the timber beams. Since the beams at the northwest end have collapsed, adequate support for the skylight walls is no longer present. The base of the skylight wall is badly twisted from its original position. As a result, it is mis-aligned when viewed from the supporting timber girder. To remedy this, braces and shims must be added as shown in Detail 4 - APPENDIX. As described on the sketch, the demolition sequence must be carefully followed to ensure stability and re-alignment of the skylight walls.

C. AREA 12 - PRESS ROOM ROOF PLAN

The 12" brick bearing walls of the east wall are badly deteriorated. Inspection of this wall revealed loose brick and an exposed continuous steel bearing plate that is attached to the underside of the roof "I" beam framing. This condition is best described in the photographs found at the end of the report. It is important to note that the steel "I" beams are closely spaced and welded to the continuous bearing plate. In general, even with substantial loss of brick, no single "I" beam is likely to slip off the wall because they are welded collectively to the embedded plate. Local grouting is required per Detail 5 -

APPENDIX to maintain adequate embedment. Continued loss of brick bearing under the plate must be monitored.

Some additional serious problems exist in **Area 12**. As a result of the roof collapse at the northeast corner, a steel pipe column has evidence of buckling but continues to support roof load. This area around the roof collapse should be roped off to protect workers near the unstable roof. The pipe column supports multiple steel members as shown in Detail 6-APPENDIX. Since the pipe column is seriously out of plumb, it is doubtful that the capacity of the column will be adequate for the applied loading.

A second condition is present at the framing around two (2) presses near the south end. Timber beams which have been cut (likely the result of setting the press in place) are now long cantilevers extending beyond the supporting girder. This condition is shown in Detail 7-APPENDIX. It appears that various load duration (e.g. rain or snow on and off the roof) over the lifetime of these members has weakened them. The excessive load and long cantilevered length (exceeding 10') is also a concern. Although the visual appearance is good, these members should be braced as per Detail 7 - APPENDIX.

V. CONCLUSION

A. OVERALL CONDITION ASSESSMENT

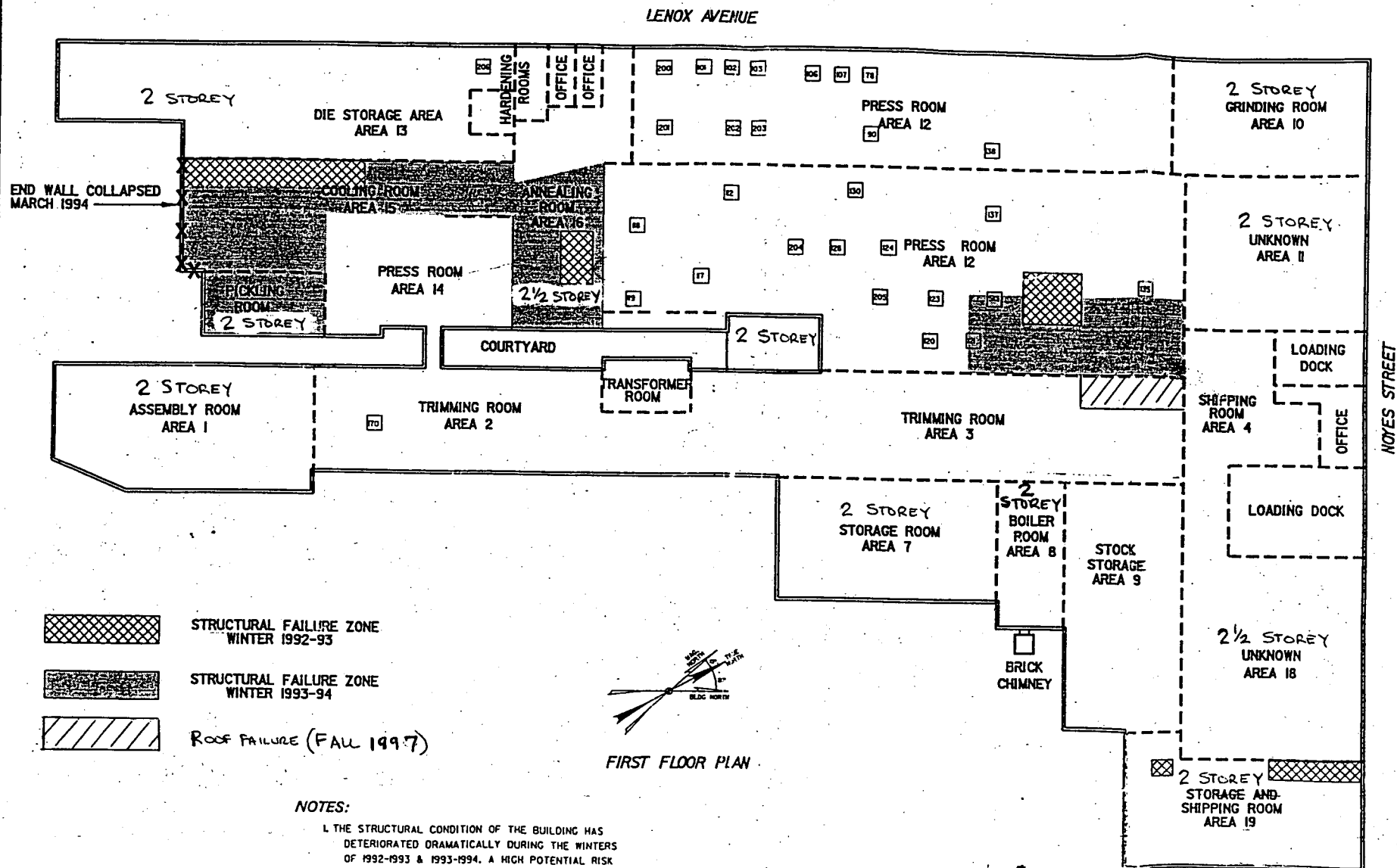
1. Conditions of the buildings are poor and based on field observation, some members may be "underdesigned" to accept the local code snow load.
2. Modifications shown in the details - APPENDIX are considered a minimum so that workmen will be safe in the continuing clean-up operations.
3. It is important that shearing operations during demolition work will not impose a lateral force to the weak brick walls.

B. RECOMMENDATIONS

1. Reinforcements to steel trusses, shoring of timber members and grouting of brick walls is needed at **Areas 2&3**. Removal of unnecessary equipment below the trusses and timber beams is advised. With these corrections, the steel trusses and timber members will have the capacity to support the code snow load.
2. Additional grouting of brick walls at designated areas is needed for **Area 12**.

3. Due to the complexity of construction in **Area 12**, additional inspections will be required so that design of reinforcements may be made.
4. Extreme caution is advised to keep heavy equipment from impact of any building column. The W6X15 column at the double-door entry to **Areas 2 & 3** is especially vulnerable. Caution or reinforcement is advised.
5. Future inspections are recommended for the remaining areas of the building(s).
6. Reinforcements should be installed prior to the first "major" snowfall.
7. Place 5/8" x 4' x 8' plywood sheets at locations shown in this report. Sheets to be located under rotted roof plank to protect workers. ALT: 9/16" OSB.
8. Rope off or barricade areas of roof collapse to protect workers from falling debris or continued collapses.

APPENDICES



NOTES:

1. THE STRUCTURAL CONDITION OF THE BUILDING HAS DETERIORATED DRAMATICALLY DURING THE WINTERS OF 1992-1993 & 1993-1994. A HIGH POTENTIAL RISK OF ADDITIONAL STRUCTURAL FAILURE, DETERIORATION AND COLLAPSE EXISTS IN THE FUTURE, PARTICULARLY DURING THE WINTER.

2. ALL AREAS ARE 1-STOREY U.N.

FORMER BOSSERT MFG. CO.
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 2 OF 7
EARTH TECH, INC. 11/5/97

FIG.
4

BOSSERT MANUFACTURING PLANT SITE REMEDIATION
STRUCTURAL FAILURE ZONES

DATE 6/22/94

DRAWN BPH

NO. 6648

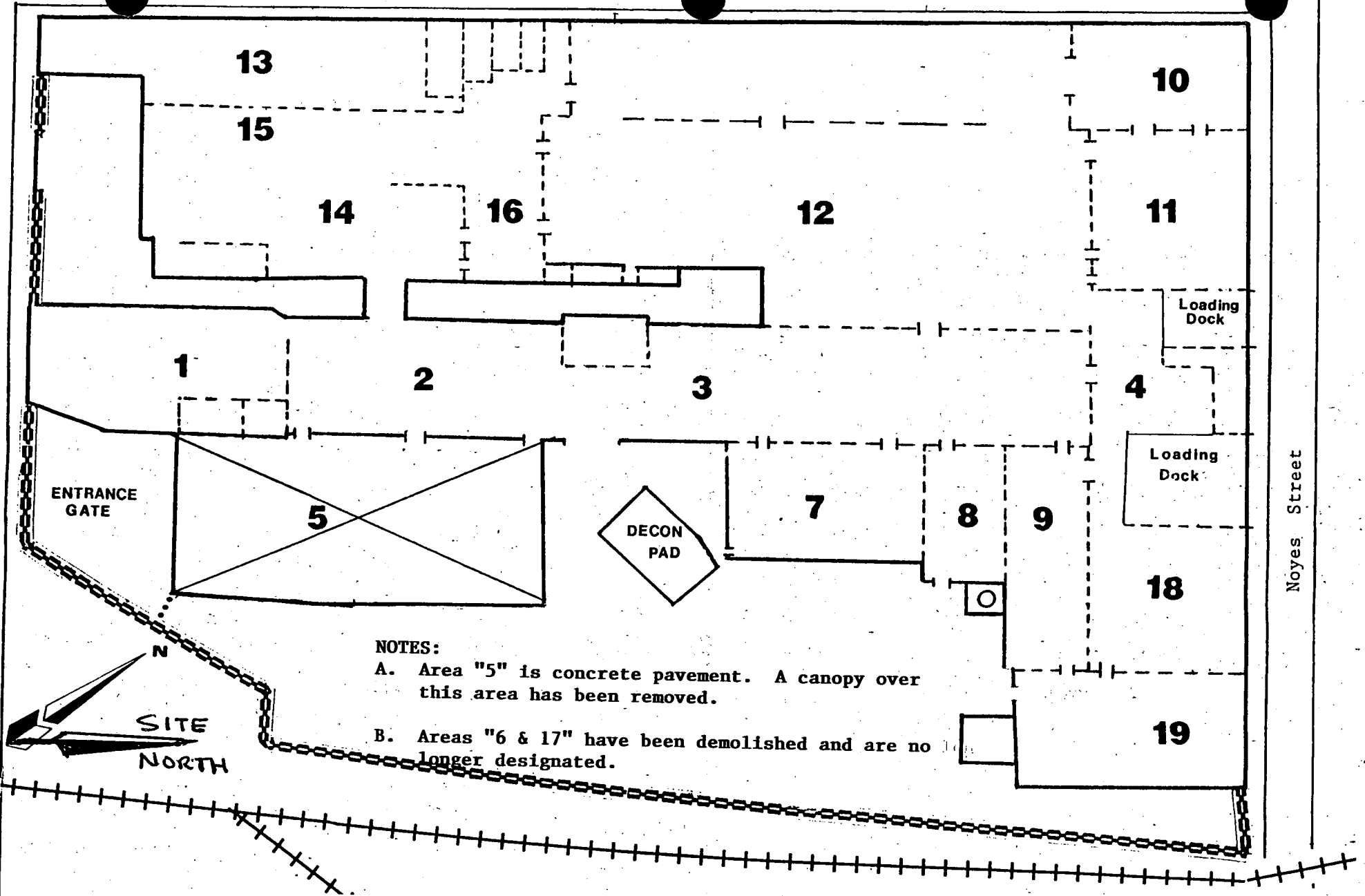
Stetson-Harza

A HARZA COMPANY

131 Genesee Street, Utica, NY 13501 (315) 371-5800
Rensselaer Technology Park
250 Jordan Road, Utica, NY 13507 (518) 231-8080

Oswego Street

Noyes Street



NOTES:

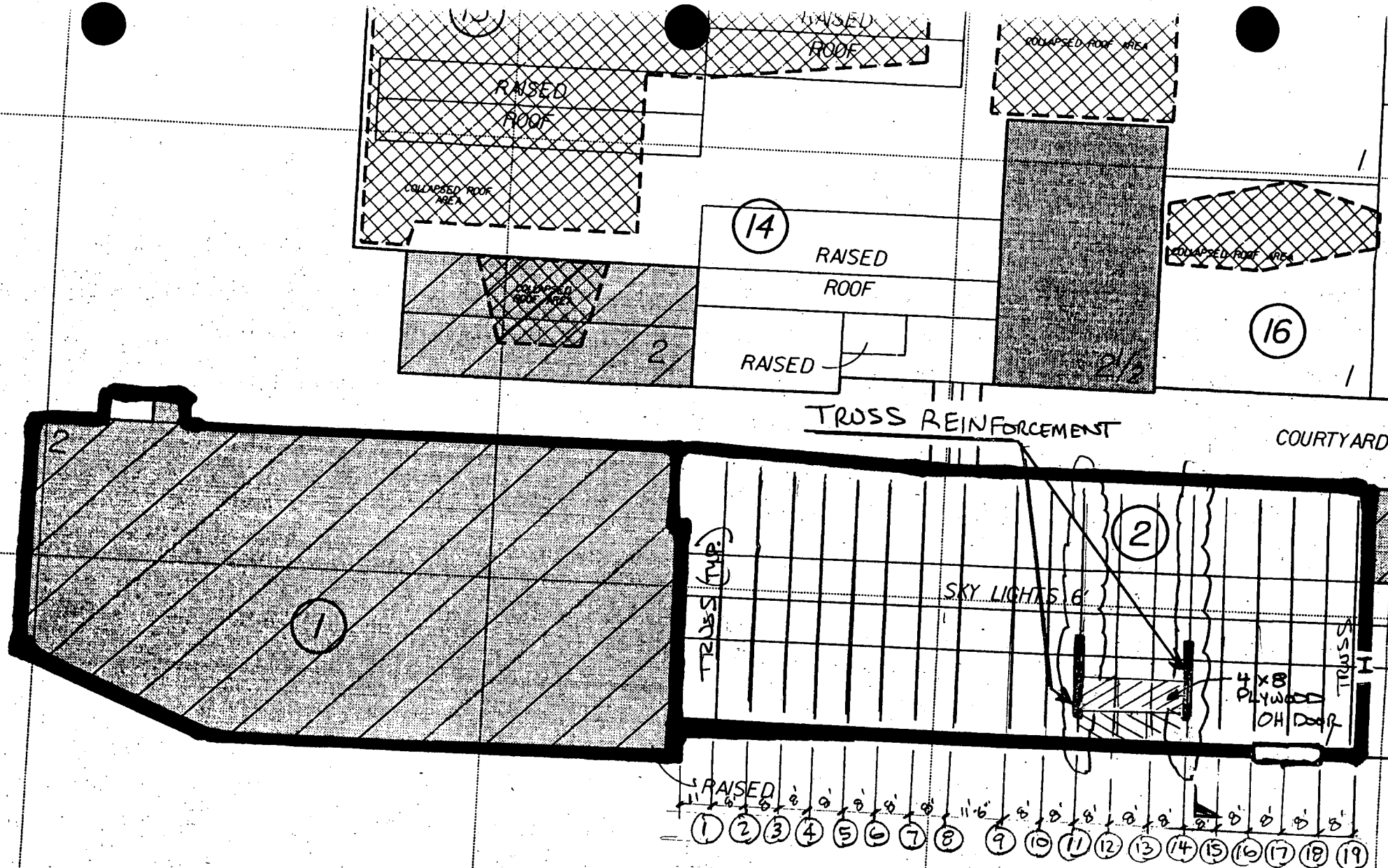
A. Area "5" is concrete pavement. A canopy over this area has been removed.

B. Areas "6 & 17" have been demolished and are no longer designated.

SITE KEY PLAN
Not to Scale

Arterial Highway (State Highways 5, 8, 12)

FORMER BOSSERT MFG. CO
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 1 OF 7
EARTH TECH, INC. 11/5/97

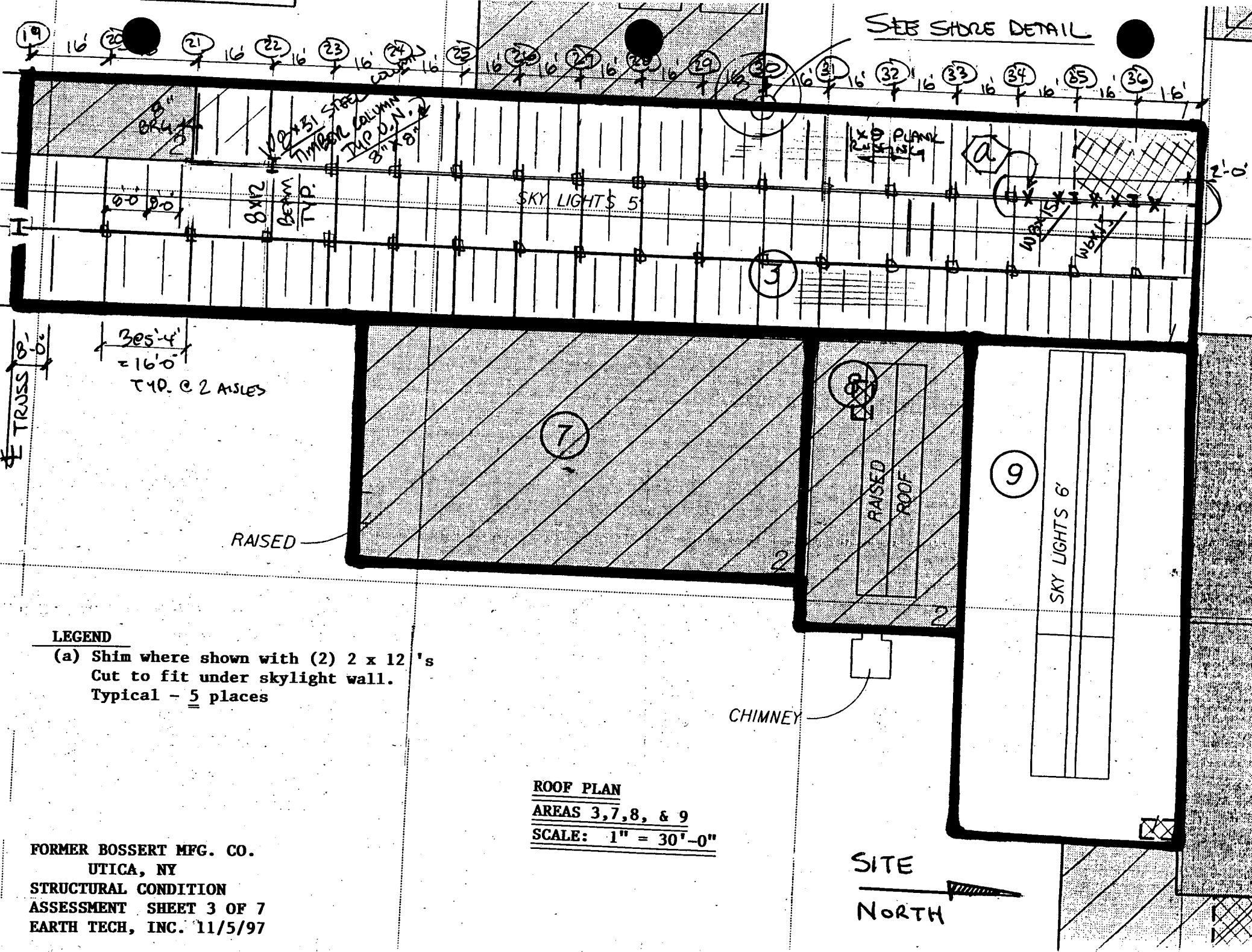


SITE
NORTH

ROOF PLAN
AREAS 1 & 2
SCALE: 1" = 30'-0"

FORMER BOSSERT MFG. CO.
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 2 OF 7
EARTH TECH, INC. 11/5/97

SEE SHORE DETAIL



LEGEND

- (a) Shim where shown with (2) 2 x 12 's
Cut to fit under skylight wall.
Typical - 5 places

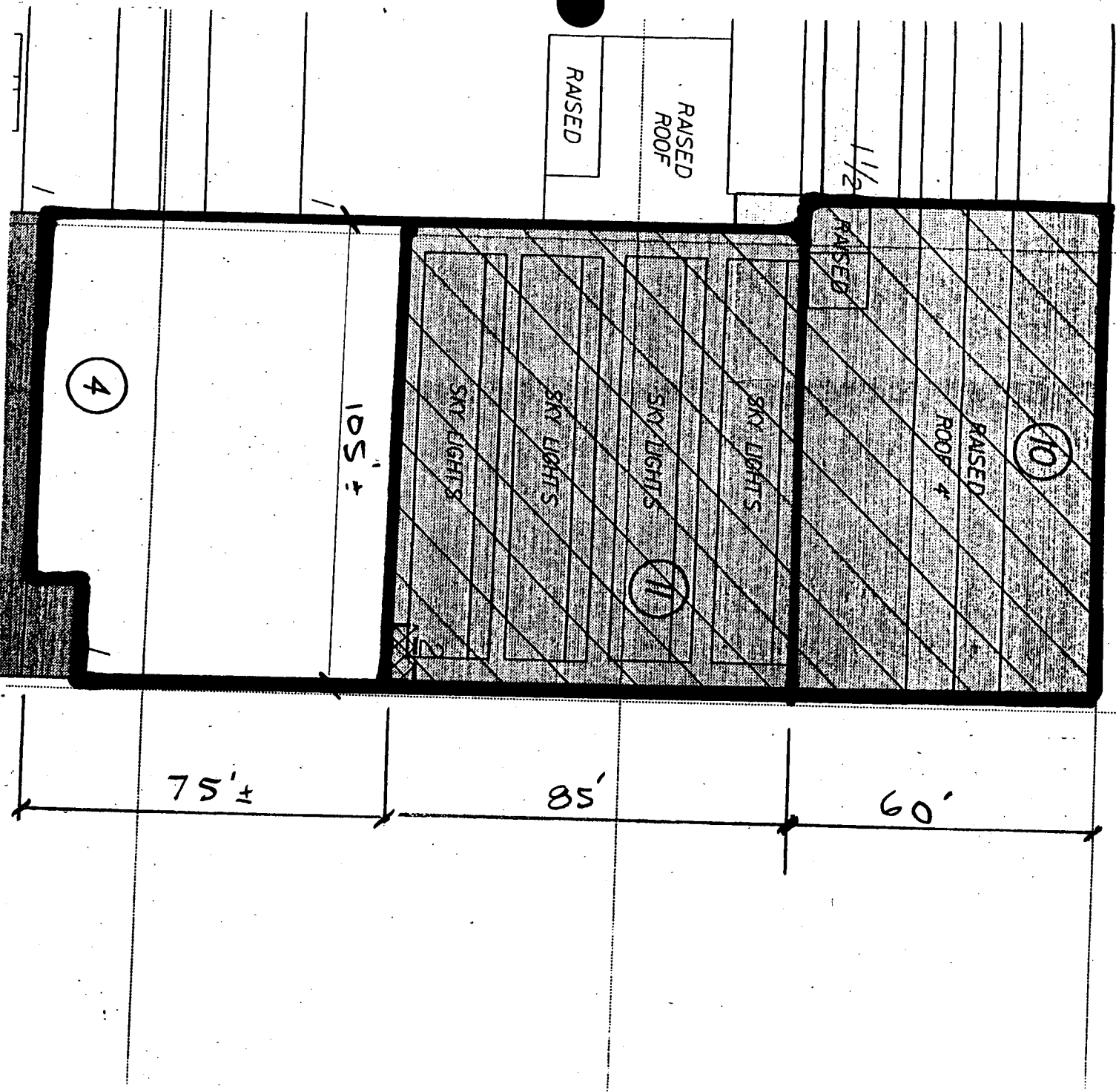
ROOF PLAN
AREAS 3, 7, 8, & 9
SCALE: 1" = 30'-0"

FORMER BOSSERT MFG. CO.
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 3 OF 7
EARTH TECH, INC. 11/5/97

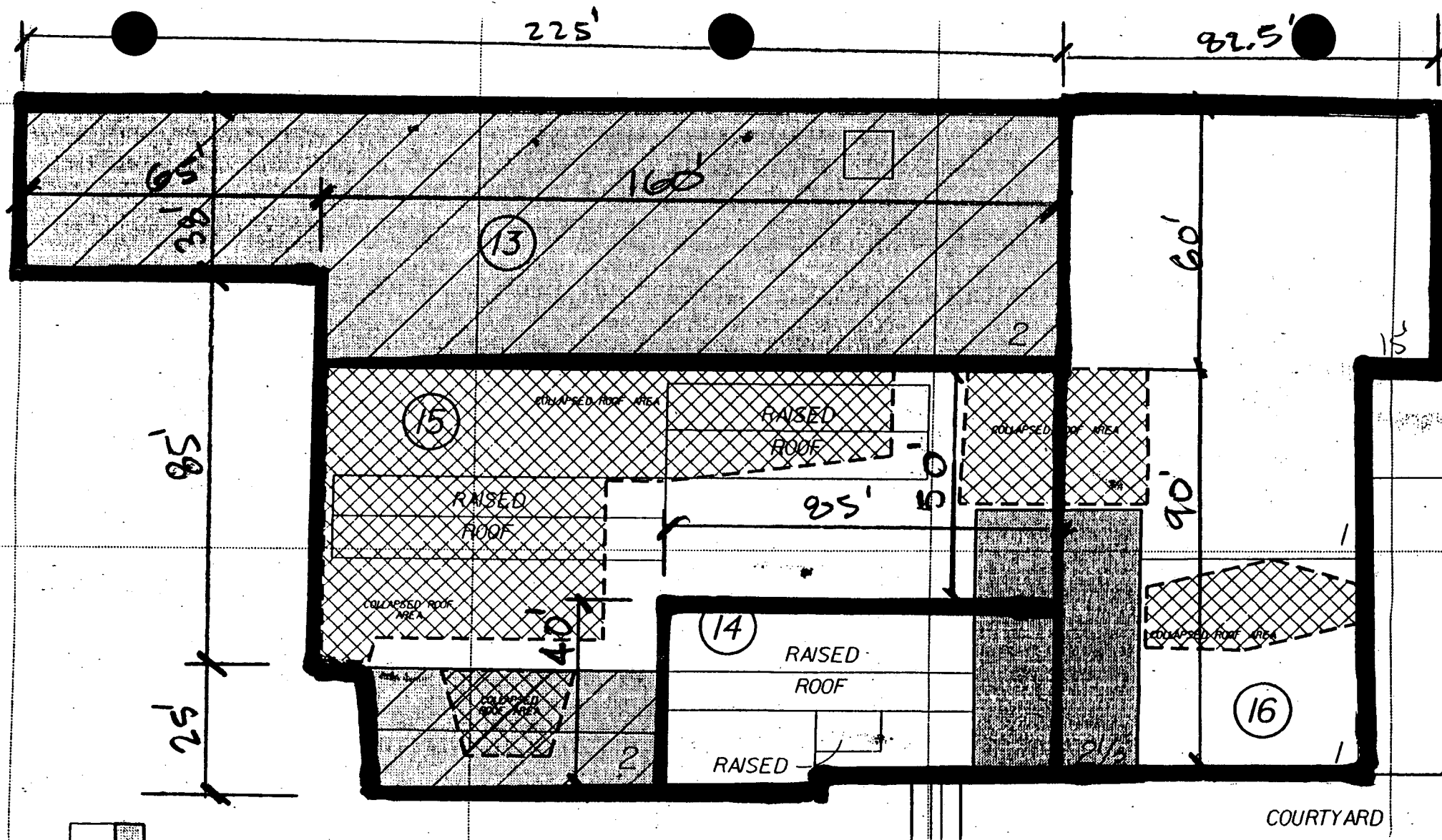
SITE
NORTH

NOTE
~~Previous~~
NORTH

ROOF PLAN
AREAS 4, 10 & 11
SCALE: 1" = 30'-0"



FORMER BOSSERT MFG. CO.
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 4 OF 7
EARTH TECH, INC. 11/5/97



ROOF PLAN
AREAS 13, 14, 15 & 16
SCALE: 1" = 30'-0"

SITE

NORTH

FORMER BOSSERT MFG. CO.
UTICA, NY
STRUCTURAL CONDITION
ASSESSMENT SHEET 6 OF 7
EARTH TECH, INC. 11/5/97

		SKY LIGHTS 6'

6

4

PAKED

FOOF-5

RAISED

SITE

NORTH

ROOF PLAN

AREAS 18 & 19

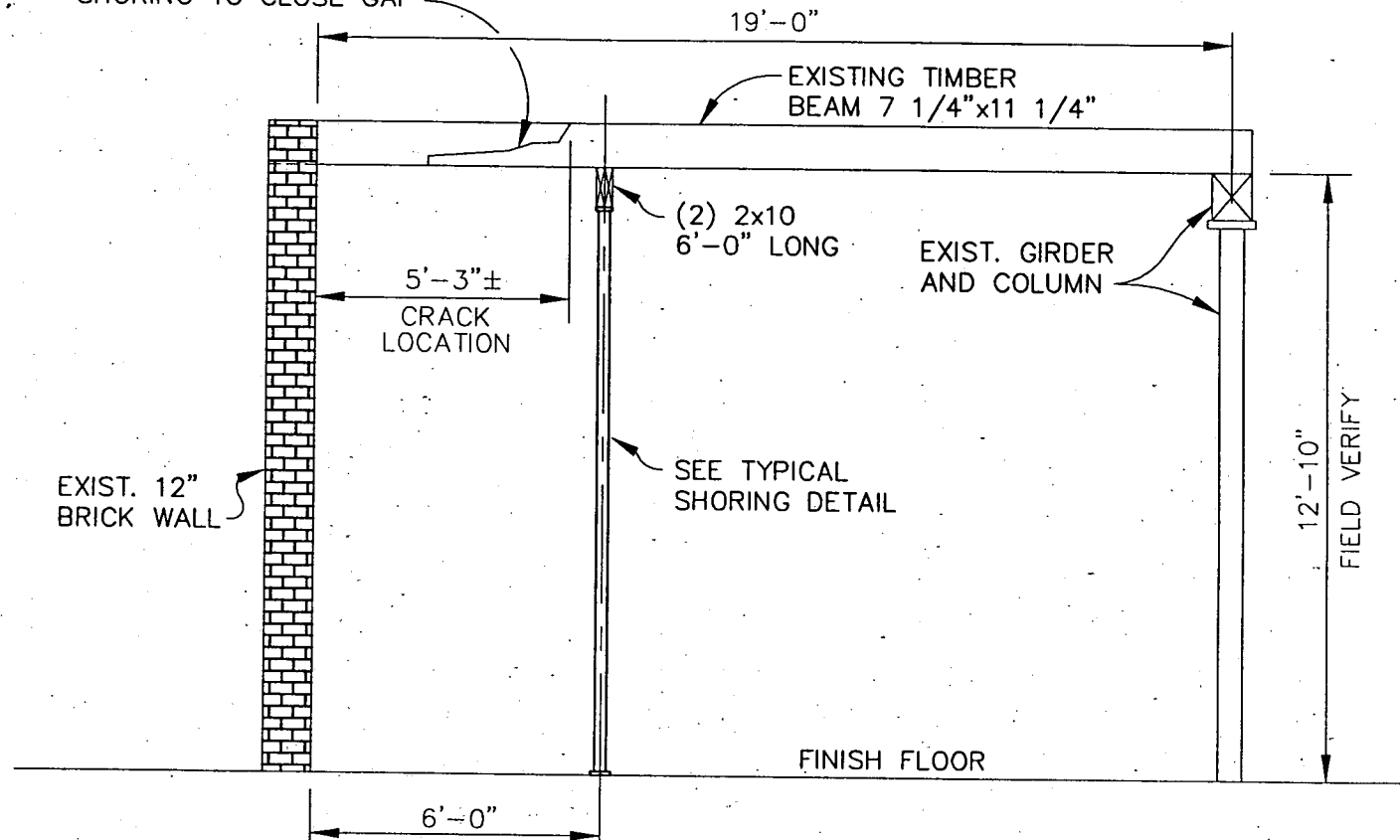
SCALE: 1" = 30'-0"

FORMER BOSSERT MFG. CO.

UTICA, NY

STRUCTURAL CONDITION
ASSESSMENT SHEET 7 OF 7
EARTH TECH, INC. 11/5/97

EXIST. TIMBER BEAM
IS SEPARATED, INSTALL
SHORING TO CLOSE GAP



NOTE:
SHORING MUST BE INSTALLED
ON EAST SIDE OF VERTICAL
CRACK

AREA 3-BUILDING ELEVATION LOOKING NORTH

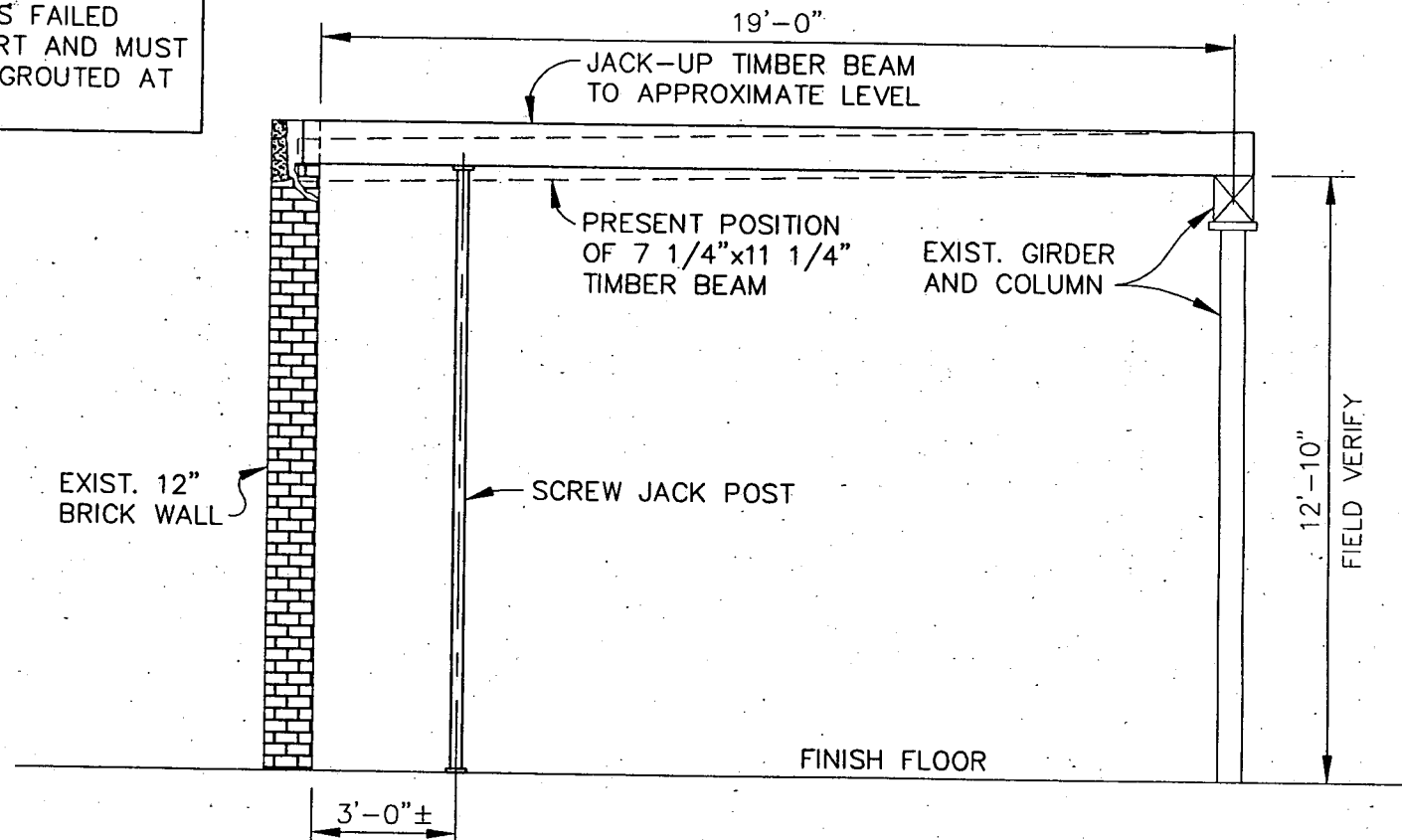
SCALE: 1/4" = 1'-0"

(FRAME LINE 34)

EARTH  TECH

NOTE:

TIMBER BEAM HAS FAILED
AT BRICK SUPPORT AND MUST
BE JACKED AND GROUTED AT
BRICK WALL

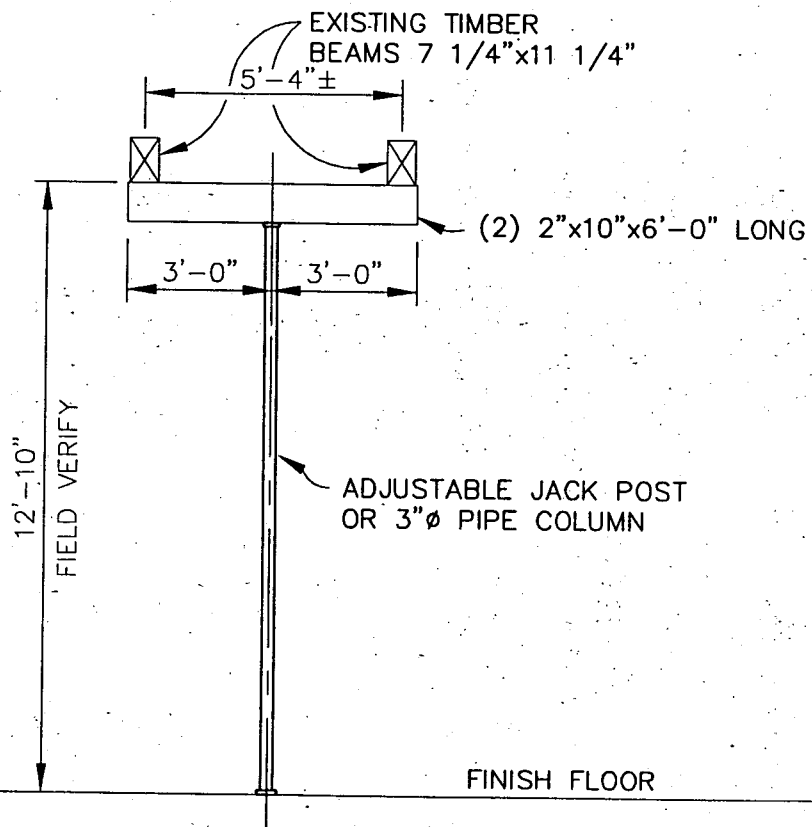


**AREA 3-BUILDING ELEVATION
LOOKING NORTH**

SCALE: 1/4" = 1'-0"

(FRAME LINE 32)

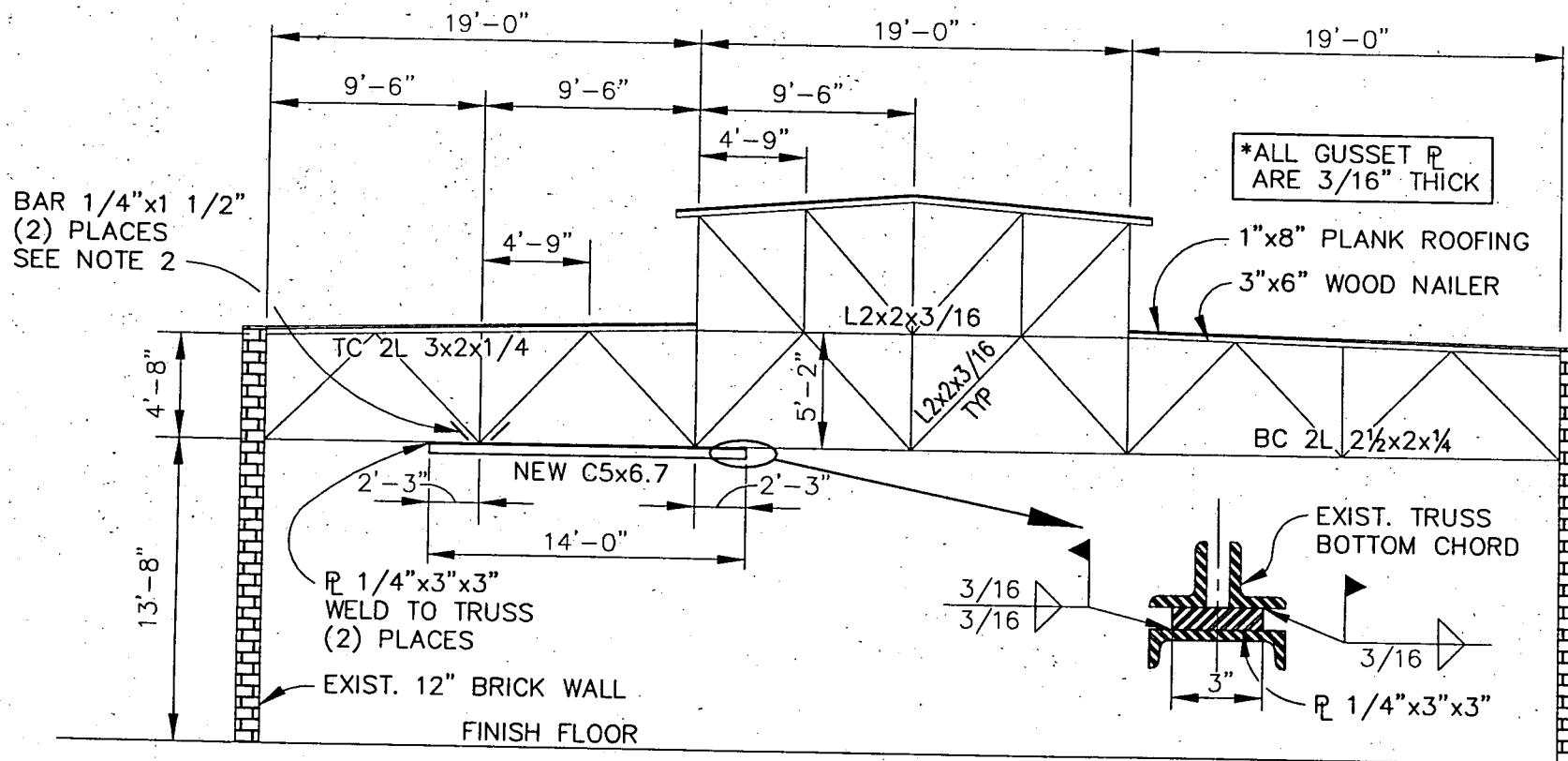
EARTH  TECH



NOTE:
SHORING MUST BE INSTALLED
ON EAST SIDE OF VERTICAL
CRACK

AREA 3-TYPICAL SHORING DETAIL AT WOOD BEAMS

SCALE: 1/4" = 1'-0"



NOTES:

1. CLEAN ALL SCALE FROM SURFACES PRIOR TO WELDING
2. PLACE 1/4"x1 1/2" BARS ON TRUSS ONLY
3. E70XX ELECTRODES
4. A36 STEEL

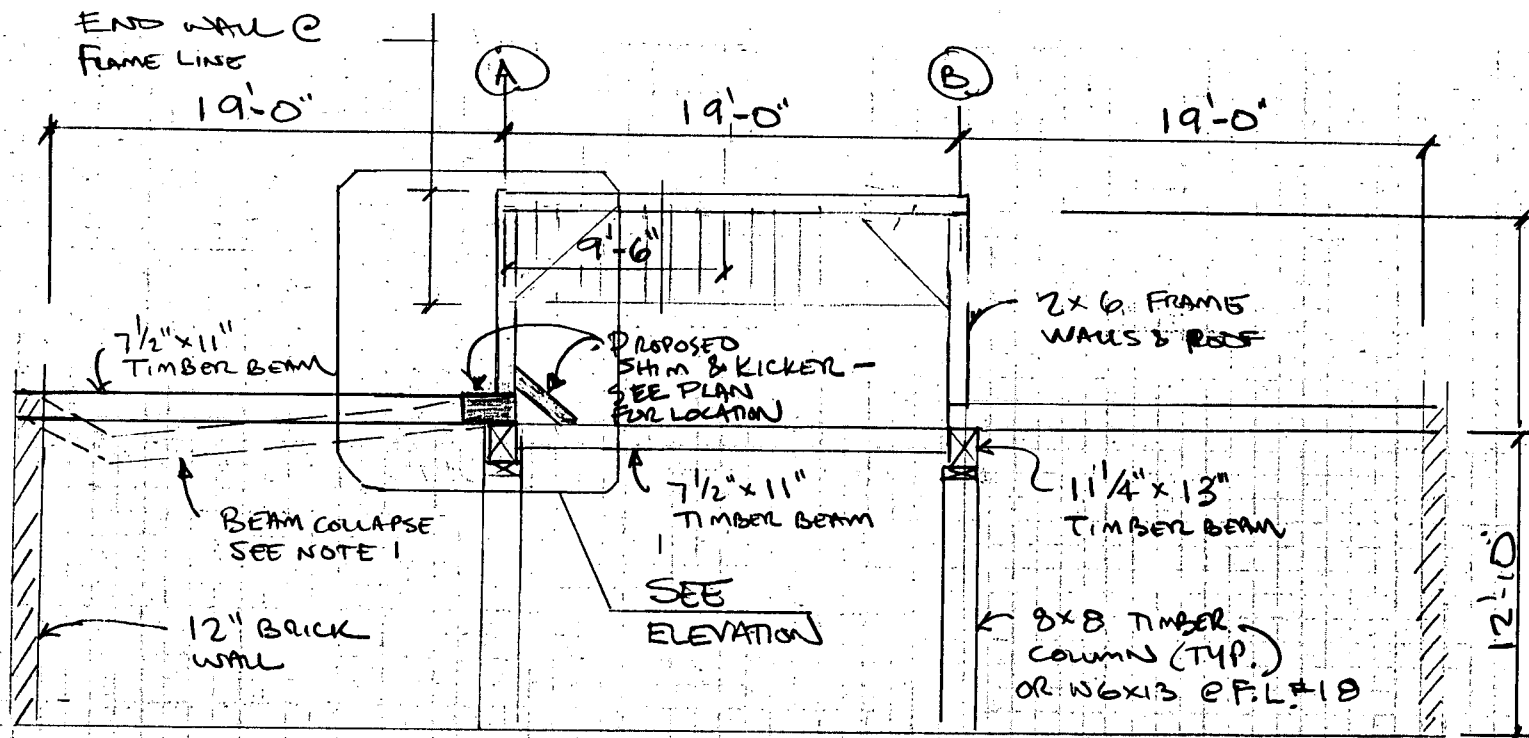
AREA 2-BUILDING ELEVATION LOOKING SOUTH

SCALE: 1/8" = 1'-0"

(TYPICAL 2 PLACES)

Calculation Sheet

Computed by WSS Subject Area 3 Sheet 1 of 2
 Checked by _____ Client Bossett Mfg. Co. Job No. 24702 Date _____

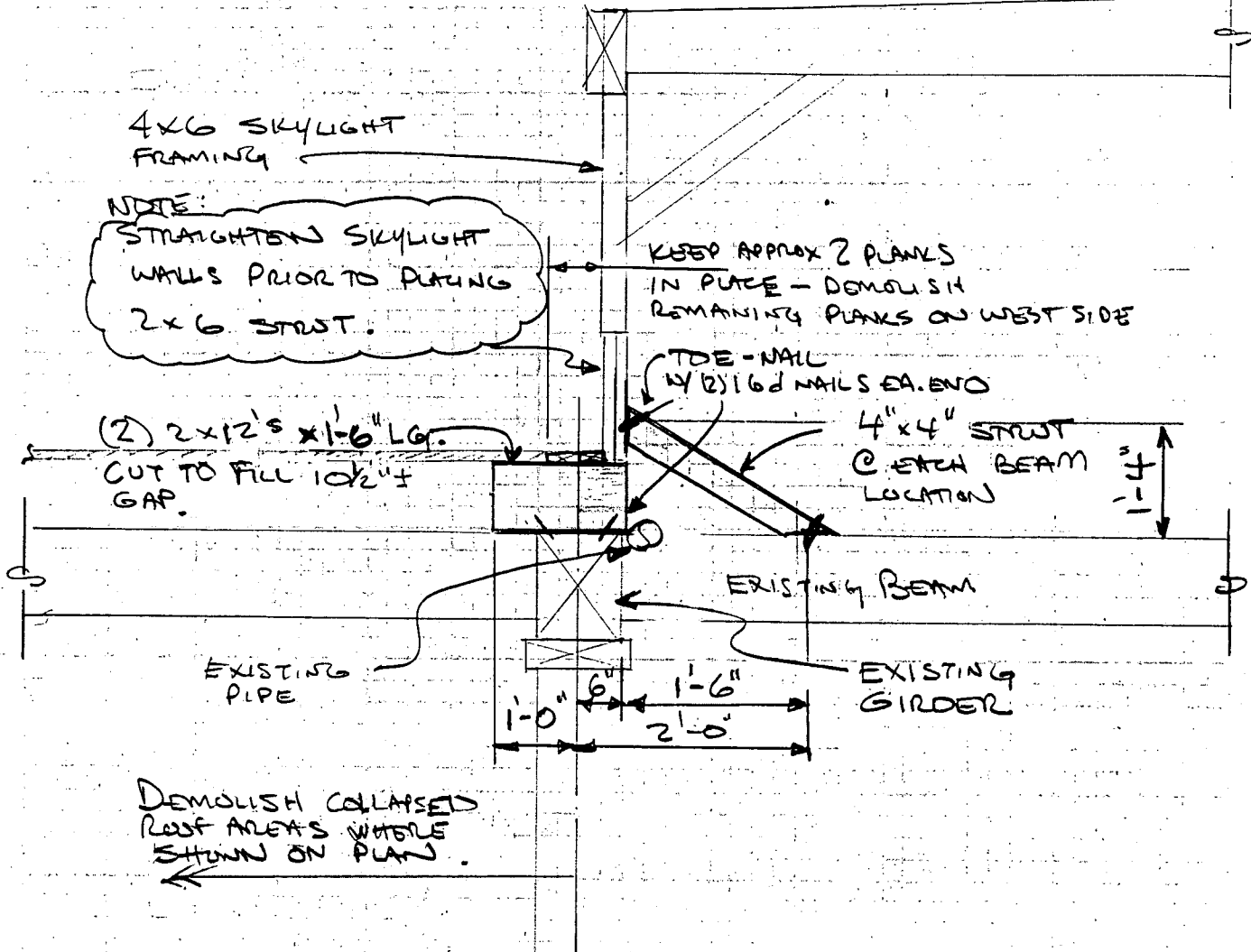


AREA 3 - BUILDING
ELEVATION LKG. NORTH



Calculation Sheet

Computed by NSS Subject TRIMMER ROOM Sheet 2 of 2
 Checked by _____ Client AREA 3 BASSETT MFG. Job No. 24708 Date 11/7/97



ELEVATION AT BEAM LOCATIONS

NORTH OF FRAME LINE 34

(LOOKING NORTH)

**Calculation
Sheet**

Computed by _____ Subject _____ Sheet ____ of ____

Checked by _____ Client _____ Job No. _____ Date _____

HOLD**DETAIL 6 PENDING FIELD INSPECTION
OF AREA 12**

**Calculation
Sheet**

Computed by _____ Subject _____ Sheet ____ of ____

Checked by _____ Client _____ Job No. _____ Date _____

HOLD**DETAIL 7 PENDING FIELD INSPECTION
OF AREA 12**

PHOTOGRAPHS

Calculation Sheet

Computed by MSS Subject BOSSERT MFG CO. Sheet 1 of
 Checked by Client AREA 2 Job No. Date 11/97



AREA 2 **STEEL TRUSS HAS MISSING LOWER
CHORD MEMBER AND DAMAGE TO
PANEL POINT GUSSET**



**Calculation
Sheet**

Computed by MSS Subject Bossent Mfg Co. Sheet 2 of
Checked by Client AREA 3 Job No. Date 11/97



AREA 3 **CENTER "AISLE" TIMBER BEAM FRAMING
TO TIMBER GIRDER. AREA 2 IS TO THE
SOUTH (RIGHT) OF THE W6x15 COLUMN**

Calculation Sheet

Computed by MSS Subject ROSSERT MFG. CO. Sheet 3 of
Checked by Client AREA 12 Job No. Date 11/97



AREA 12 ROOF COLLAPSE. ADDITIONAL INSPECTION
AND SUBSEQUENT REINFORCING IS PENDING

**Calculation
Sheet**

Computed by MSS Subject Bossert MFG Co. Sheet 4 of
Checked by Client AREA 12 Job No. Date



AREA 12 **BRICK WALL IN POOR CONDITION WITH
LOOSE AND MISSING BRICK. NOTE THAT
BEARING PLATE ON UNDERSIDE OF
STRUCTURAL STEEL ROOF BEAMS
IS EXPOSED**